

WHAT IS CLAIMED IS:

1. A power control circuit for an electrical power transfer device, comprising:

an input power conditioning circuit for switching input power to obtain a desired power condition;

5 a power control circuit coupled to the power conditioning circuit for controlling input power drawn by the power conditioning circuit;

an input signal indicative of input power and coupled to the power control circuit; and

10 an output signal indicative of output power and coupled to the power control circuit, the power control circuit operable to control the power conditioning circuit such that input power tracks with output power.

2. The circuit according to claim 1, further comprising:

a DC bus coupled to the power conditioning circuit for transferring DC power supplied by the power conditioning circuit; and

an estimator circuit coupled to the DC bus and operable to provide the output signal indicative of output power based on measurements obtained from the DC bus.

3. The circuit according to claim 1, wherein the power conditioning circuit is a power factor correction power converter.

4. The circuit according to claim 1, wherein the input signal indicative of input power comprises:

an input current signal indicative of input current provided to the power conditioning circuit; and

5 an input voltage signal indicative of voltage supplied to the power conditioning circuit.

5. The circuit according to claim 4, wherein the input current and input voltage are in phase with each other.

6. The circuit according to claim 5, wherein the input power signal indicative of input power is obtained through an arithmetic operation involving the input current and the input voltage.

7. The circuit according to claim 2, further comprising a power inverter coupled to the DC bus for providing a switched power output.

8. The circuit according to claim 7, further comprising a bus capacitor coupled to the power inverter and having a reduced specified rating.

9. The circuit according to claim 7, further comprising an inductor on the DC bus and coupled to the power inverter and having a reduced specified rating.

10. The circuit according to claim 7, wherein the power output signal indicative of output power is obtained based on direct measurements of speed and torque of a motor coupled to the power inverter.

11. A method for controlling power in a power transfer device, comprising:

obtaining an indication of input power supplied to the power transfer device;

obtaining an indication of output power delivered from the power transfer

device;

controlling a power conversion device to draw input power that tracks with output power, based on the indication of input power and the indication of output

power.

12. A method for minimizing energy requirements for a passive component in a power transfer device, comprising:

obtaining an indication of input power to the power transfer device;

obtaining an indication of output power supplied by the power transfer

5 device; and

controlling a power converter circuit coupled to the input power to draw input power such that the input power tracks with the output power based on the indications of the input and output power, respectively.

13. A power factor correction circuit, comprising:

an input power line coupled to an input of the power factor correction circuit for supplying input power to the power factor correction circuit;

5 a DC bus coupled to an output of the power factor correction circuit for receiving output power from the power factor correction circuit;

a passive component coupled to the DC bus for storing and delivering power on the DC bus; and

10 a power control signal input coupled to the power factor correction circuit for controlling the power factor correction circuit to draw input power from the input power line based on an output power indication related to power on the DC bus.

14. The circuit according to claim 13, wherein the output power indication is derived from measurements of the DC bus.

15. The circuit according to claim 13, wherein the output power indication is derived from measurements of at least one of a torque and velocity output.

16. A power control circuit for controlling power in a power transfer circuit, the power control comprising:

an indication of at least one of an input current and voltage to provide an indication of input power;

- 5        an input power signal related to a power output of the power transfer circuit; a control operator circuit coupled to the power transfer circuit and operable to provide power control signals to the power transfer circuit to draw input power that tracks with output power based on the inputs to the power control circuit.

17. A circuit according to claim 16, further comprising an estimator circuit operable to provide an indication of output power of the power transfer circuit and coupled to the power control circuit.

18. An inverter controller, comprising:

an inverter control for providing switching signals to a power inverter;

a DC voltage input coupled to the inverter controller and indicative of a bus voltage supplied to the power inverter;

- 5        a power control circuit operable to provide control signals to control power in the power inverter circuit;

an input power signal indicative of input power to the inverter circuit and coupled to the power control circuit; and

- 10        an output power signal indicative of output power of the inverter circuit and coupled to the power control circuit, the signals provided by the power control circuit influenced by the input and output power signals to control power in the power inverter circuit such that input power tracks with output power.

19. An integrated circuit for controlling a power inverter circuit,

comprising the controller of claim 18.